

### **AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows:

#### **Listing of Claims:**

Claims 1-39 (Cancelled).

Claim 40 (New): A method for forming and picking up an image by using an apparatus having an opening, an intermediate plane, and a two-dimensional image pick-up device, the method comprising the steps of:

forming a first undistorted image of an object by waves of a first kind through the opening onto a front surface of the intermediate plane;

converting the first undistorted image of the object to waves of a second kind emitting from the rear surface of the intermediate plane, the intermediate plane acting as a wave converter from the waves of the first kind to the waves of the second kind, the waves of the second kind detectable by the two-dimensional image pick-up device;

forming a second distorted image by waves of a second kind onto an image sensor of the two-dimensional image pick-up device; and

outputting a corrected image of the object by the two-dimensional image pick-up device, by using information of the first undistorted image and second distorted image for distortion calibration.

Claim 41 (New): The method for forming and picking up an image according to Claim 40, wherein the intermediate plane includes a calibration grid pattern as a coordinate reference for the intermediate plane, the method further comprising the steps of:

correcting the distortion of the second distorted image to output the corrected image of the object with a computer by using information of a correspondence between digital

coordinate of the first undistorted image with reference to the calibration grid pattern and the digital coordinate of the second distorted image; and

outputting a corrected image of the object by correcting image distortion by establishing a one-to-one correspondence between discrete points of the first undistorted image and discrete points of pixel of the image sensor by using a correspondence table having the one-to-one correspondence, and by using the correspondence table between grid points of the intermediate plane and grid points of the image sensor.

Claim 42 (New): The method for forming and picking up an image according to Claim 41, wherein the number of grid points of the calibration grid pattern is large enough to satisfy the accuracy of the spatial distortion of an application processing the outputted corrected image.

Claim 43 (New): The method for forming and picking up an image according to Claim 41, wherein a diameter of the opening is large, and a distance between the opening and the intermediate plane is long in comparison with a size of the intermediate plane, so that the first undistorted image on the intermediate plane is large and an optimum spatial resolution of the image can be achieved.

Claim 44 (New): The method for forming and picking up an image according to Claim 41, wherein a diameter of the opening is small, and a distance between the opening and the intermediate plane is short in comparison with a size of the intermediate plane, so that the first undistorted image on the intermediate plane is small and an optimum spatial resolution of the image can be achieved.

Claim 45 (New): The method for forming and picking up according to Claim 41, wherein wave-detecting elements of the intermediate plane are placed at grid points of the calibration grid pattern, by making a space where the grid points are placed large enough and a length between the opening and the intermediate plane long enough and the first undistorted image on the intermediate plane large enough so that the intermediate plane itself serves as a two-dimensional image pick-up device.

Claim 46 (New): The method for forming and picking up an image according to Claim 40, wherein the waves of the first kind are X-rays or gamma rays.

Claim 47 (New): The method for formation and picking up an image according to Claim 40, wherein the waves of the first kind are quantum waves of a particle due to dual nature of the particle, or sound waves.

Claim 48 (New): An apparatus for forming and picking up an image comprising  
an opening provided in a shield intercepting a propagation of waves of a first kind;  
an intermediate plane for capturing a first undistorted image formed by the opening  
and the waves of the first kind on a front surface of the intermediate plane, and for converting  
the waves of the first kind to waves of a second kind on a rear surface of the intermediate  
plane;

a secondary imaging system to project the waves of the second kind onto a surface;  
a two-dimensional image pick-up device for picking up the image formed on the  
surface by the waves of the second kind; and

a housing for integrating the opening, the intermediate plane, and the two-dimensional  
image pick-up device.

Claim 49 (New): The apparatus for forming and picking up an image according to Claim 48, wherein the intermediate plane includes a calibration grid pattern.

Claim 50 (New): The apparatus for forming and picking up an image according to Claim 48, wherein the waves of the first kind are visible waves or sound waves.

Claim 51 (New): The apparatus for forming and picking up an image according to Claim 48, wherein the waves of the first kind are X-rays or gamma rays.

Claim 52 (New): The apparatus for forming and picking up an image according to Claim 49, wherein distortion caused by the secondary imaging system is produced by at least one of lenses or mirrors, the apparatus further comprising:

a computer for automatically correcting the waves of the second kind by using the calibration grid pattern of the intermediate plane; and

an output unit for outputting a corrected signal of an image.